CANNIBALISM AND NEW PRODUCT DEVELOPMENT

Product cannibalism–gaining sales for a new product by diverting them from an existing product–may be the unwelcomed consequence of new product development.

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Inflation, slowed economic growth, resource shortages, and foreign competition are placing unprecedented pressures on product management. Properly or improperly, many firms appear to be focusing their efforts on opportunities that offer minimal market resistance. A. T. Kearney, Inc., noted recently that reformulated products directed toward existing markets have a substantially higher likelihood of success than product innovations directed at new markets.[1] While product line extension or repositioning strategies pose minimal risk of failure for the product being introduced, potential negative effects on existing products serving existing markets must be considered. These effects can be called product cannibalism. While some cannibalism may be planned or expected, considerable amounts of cannibalism may be an unexpected consequence of an improperly managed new product development process.

Examples of planned and unplanned product cannibalism abound. Earlier this year, Anheuser-Busch noted that 20-25 percent of the volume for its new brand, Michelob Light, would come from the existing Michelob brand because of the low-calorie appeal among current customers.[2] When General Foods introduced Maxim, linkages to the existing Maxwell House brand through packaging and promotion resulted in a loss of market share for the entire line. Similarly, Ford's introduction of the Falcon as a "new-sized Ford" at a lower price led consumers to substitute Falcons for existing Ford models.[3]

CANNIBALISM AND NEW PRODUCTS

The theoretical roots of product cannibalism can be traced to the cross-elasticity of demand theory. This theory suggests that the percentage change in the price of product A

1. "The Breakdown of U.S. Innovation," *Business Week*, February 16, 1976: 46-60ff.

2. "Anheuser-Busch, Inc., Has Another Entry in 'Light Beer' Field," *Wall Street Journal*, February 13, 1978: 4.

3. William Copulsky, "Cannibalism in the Marketplace," *Journal of Marketing*, October 1976: 103-105.

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demanded will be influenced by the percentage change in the price of product B. The demand interrelationship of the two products may then be described as independent, complementary, or substitutable. In the case of product substitution, or cannibalism, a lowering of the price on product A will tend to decrease the quantity demanded for product B and effect a leftward shift in the demand curve for product B, providing "other things remain equal."

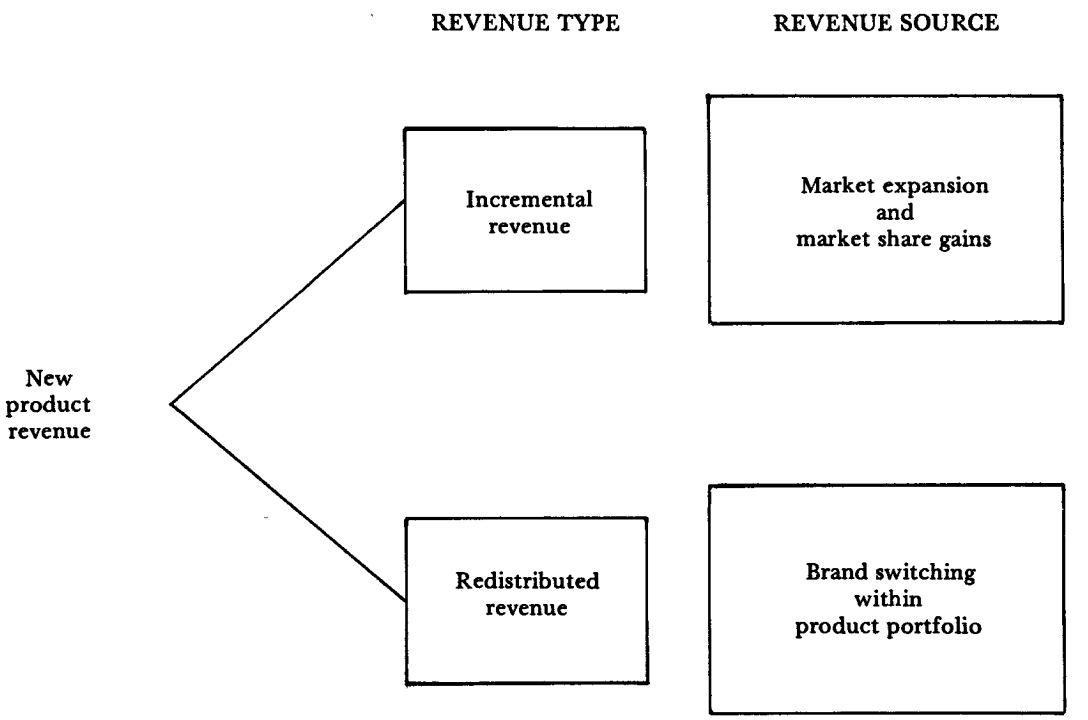
From a marketing standpoint, however, other things rarely "remain equal." Accordingly, an expanded interpretation of cross-elasticity of demand is necessary. In addition to price changes, physical and symbolic attributes of products, alternative means of promoting products, and potential end-use interchangeability between products must be considered. The Michelob Light, Maxim, and Falcon experiences illustrate these marketing effects.

As shown in the figure, new or reformulated products acquire their sales revenue from three sources: (1) new consumers who were not previously buyers of the product type, (2) consumers of competitive brands, and (3) consumers of an existing company brand who switch to the new or reformulated brand or product. The first two sources represent, respectively, incremental revenue for the product portfolio because of market expansion, and the capturing of competitors' market share. The remaining source represents "redistributed" revenue, or cannibalization, in that existing buyers are substituting one item for another in the company's product portfolio. Accordingly, product cannibalization has been defined as "the process by which a new product gains a portion of its sales by diverting them from an existing product."[4]

This process of sales diversion or redistri-

4. James Heskett, *Marketing* (New York: Macmillan, 1976): 581.

Components of New Product Sales Volume



bution of revenue has a subtle but managerially important consequence. Assuming that the change in profits earned by the existing product is negative because of substitution, this amount should be added to the incremental cost curve for the new or reformulated product.[5] The implication is clear. Sales and profit gains of new products at the expense of an existing product do not filter down to the bottom line. Rather, the loss of potential profits from a cannibalized product is a real cost that must be absorbed by the new product. The adage, "You can't have your cake and eat it, too," applies when cannibalism occurs.

These comments illustrate the importance of performing a marginal analysis on the new product and the modified character of the product portfolio within the context of present and forecasted market conditions. Incremental revenue, cost, and investment must be considered.

FOSTERING CANNIBALISM

The erosion of an existing product's share of the market through new product cannibalism may stem from management decisions, or it may be a necessary evil, given market conditions. Cannibalism becomes a problem when it provides no incremental competitive or financial benefit to the firm's product portfolio. Several managerial decisions appear to foster cannibalism of existing brand volume with no benefit to the firm:

– Strong top management pressure for growth from new products.

– Preoccupation with developing a full line of products in an attempt to achieve increases in overall market share in a product class.

– Inadequate positioning of new products resulting in their seeking the identity of existing products.

– Unrealistic or excessive market segmentation resulting in "two segments" with demands for identical product attributes or end-use needs.

– Aggressive promotional efforts reflected in sales representatives' overemphasis on new brands and neglect of existing products.

Product cannibalism by itself should not be viewed only negatively. Cannibalism by new products sometimes represents an outgrowth of effective and competitive product portfolio management. For example, a brand with cannibalism potential may be introduced to eliminate gaps in a product line that might be filled by competing offerings or to neutralize competitive inroads. In other words, it may be wiser to have buyers switching brands within a firm's product line than to have them switching out and purchasing competitive offerings. Viewed in this manner, preemptive cannibalism becomes a viable choice.

Bristol-Meyers' introduction of Datril to compete with McNeil Laboratories' Tylenol appears to be a case in point. Bristol-Meyers held a position of strength in the aspirin segment of the analgesic market with its Bufferin and Excedrin brands. However, this segment, while large, had plateaued in the mid-1970s. During the same period, the acetaminophen (noninflamatory compounds) segment of the analgesic market dominated by McNeil Laboratories had grown substantially, with a portion of the growth coming from former and potential aspirin users. Datril's introduction would hopefully attract aspirin switchers (that is, switching away from company brands) and top existing and potential acetaminophen buyers who would most likely purchase Tylenol. Therefore, even though Datril might cannibalize Excedrin and Bufferin, aspirin switchers would remain in the Bristol-Meyers product line rather than being attracted to Tylenol.

5. For an expanded discussion of this relationship, see "An Introduction to Multiple Product Analysis," in Eugene Singer, *Antitrust Economics: Selected Legal Cases and Economic Models* (Englewood Cliffs, New Jersey: Prentice-Hall, Inc., 1968): 177-186.

IBM's introduction of the Series/1 minicomputer represents another possible application of preemptive cannibalism. Although the new product would compete in some respects with IBM's existing offering, the potential for attracting new buyers of competitive products as well as maintaining dominance in their product markets would offset any lost sales that might result.

FISCAL CONSEQUENCES

An analysis of a hypothetical multiproduct firm serves to illustrate the fiscal consequences of product cannibalism. This firm has an existing product that was expected to capture 5 percent of a market forecasted at 15 million units, or 750,000 units. At a $2.00/unit price and a $1.00/unit gross mar-

An Example of Product Cannibalism

	A	B			
	Existing product alone	*Existing product*	+ *New product* =	*Products combined*	*Incremental analysis*
Forecast total Market units	15,000,000			18,000,000	
Forecast market share	5%			10%	
Forecast unit volume	750,000			1,800,000	
Source of volume:					
New customers	50,000		950,000	950,000	
Competitors' customers	200,000	100,000	100,000	200,000	
Cannibalized customers			200,000	200,000	
Repeat customers	500,000	450,000		450,000	
TOTAL	750,000	550,000	1,250,000	1,800,000	
Resulting market share		3.1%	6.9%	10%	
Unit price	$2.00	$2.00	$1.75		
Total revenue	$1,500,000	$1,100,000	$2,187,500	$3,287,500	$1,787,500
Gross margin / unit	$1.00	$1.00	$0.75		
Gross margin dollars	$750,000	$550,000	$937,500	$1,487,500	$737,500
Marketing expenditures and allocated overhead	$300,000	$300,000	$450,000	$750,000	$450,000
Profit before tax	$450,000	$250,000	$487,500	$737,500	$287,500
Investment	$4,500,000	$4,500,000	$1,000,000	$5,500,000	$1,000,000
Return on investment	10%	5%	48.7%	13%	28.7%
Less cannibalized volume* (200,000 units x $1.00)			$200,000		
Revised profit before tax		$250,000	$287,500	$537,500	$87,500
Revised ROI			28.7%	9.7%	8.7%

*NOTE: Cannibalized volume should appropriately be subtracted from gross margin dollars produced by the new product. If this were done, the revised profit and ROI calculations would be inserted into the original profit and ROI computation. The format used here is designed to illustrate critical variances in the analysis.

gin, forecasted sales are $1.5 million with a $750,000 gross margin. Budgeted marketing expenditures plus allocated overhead total $300,000, which will provide a $450,000 profit before taxes and a 10 percent return on investment. An abbreviated pro forma income statement describing these figures is shown in column A of the table on page 28.

A new product is introduced that satisfies several, but not all, buyer requirements met by the existing product in addition to several other needs. The new product is priced at $1.50/unit, with a $.75/unit gross margin. The lower price and modified product benefits are expected to expand the market for this product type by 20 percent to 18 million units. Both products combined are expected to capture 10 percent of the expanded market, or 1.8 million units, which represents a 240 percent increase over forecasted volume for the single existing product. Marketing expenditures plus allocated overhead for the new product are budgeted at $450,000. Incremental investment for the new product is $1 million. Most of the volume captured by the new product comes from market expansion because of the lower price and differentiated product benefit structure. However, slightly more than a 25 percent cannibalism rate occurs from the existing product.

Column B in the table shows the effects of the activities and events described for the existing product and the new product, individually and combined. Also shown is an incremental analysis comparing the existing product alone versus the existing and the new product combined. Given the conditions of the example cited, the apparent new product profit is, in fact, much less when cannibalized volume at the existing product's contribution is subtracted. The apparent return on investment for the product line with the new product is inflated; it is actually less than the return on investment for the existing product when cannibalized volume is taken into account. Finally, the incremental analysis reveals that the incremental profit from the new product is only 30 percent of what it appears to be without consideration of cannibalism's effects.

This example highlights several ramifications of product cannibalism:

– Without accounting for product cannibalism in new product introductions, new product volume and profits may be more illusionary than real.

– New product introduction examined in an isolated fashion, without also considering cannibalized volume, provides a distorted view of product line profits and return on investment.

– Market share growth for a product line resulting from new product introduction may represent Pyrrhic victories in terms of product line profitability and individual item volume.

– Both the amount and source of potential new product volume must be considered in product line planning to calculate the impact of cannibalism on product line profitability.

The table can also be used to illustrate the potential effects of preemptive cannibalism. Suppose in our hypothetical situation that the new product described was used as a retaliatory device to meet a competitor whose lower-priced product was capturing a portion of the existing product's market share. If one considers the new product's cannibalized volume as potentially lost to the competitor, then these buyers are being kept by the firm, albeit at a lower return. If the new product were not introduced, 200,000 units would be lost, resulting in a 5 percent return on the existing product's investment. Even with cannibalism considered, the firm's new product will virtually preserve the return on investment percentage, thus showing the benefit of preemptive cannibalism.

IDENTIFYING POTENTIAL

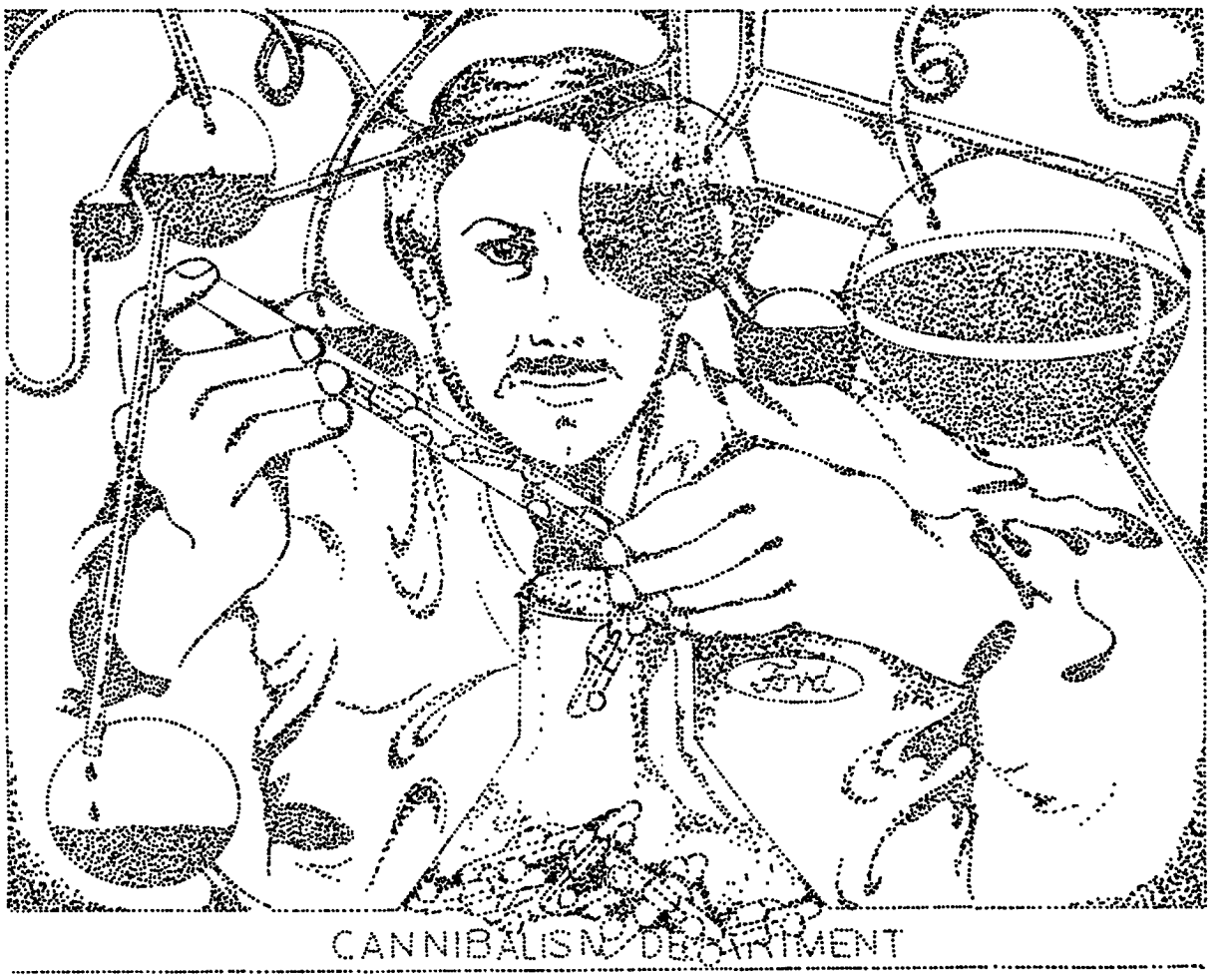
The importance of identifying cannibalism potential in new product development cannot

be overemphasized. Cannibalism effects should be considered throughout the product development process, beginning with concept testing and continuing through commercialization. Cannibalism potential can be identified during the concept evaluation stage, providing that product concepts are examined in light of end-use contexts rather than in an isolated, product-specific fashion. More specifically, product attributes should be evaluated in terms of their importance in satisfying a specific need. Louis Sharpe and Kent Granzin report that the analysis of product attributes in usage contexts enhances brand purchase predictions.[6] Edgar A. Pessemier and James Myers have recently developed promising research techniques that incorporate usage attribute criteria in concept testing.[7] Each offers a means for the early detection of potential cannibalism and possible end use interchangeability between products or concepts used in a specific situation.

Once the potential for cannibalism is recognized during the concept stage, the business analysis stage of the product development process should address the question of the source and amount of potential new product volume expected. Based on the concept test results, it would seem that the

6. Louis Sharpe and Kent Granzin, "Brand Attributes That Determine Purchases," *Journal of Advertising Research,* April 1974: 39-42.

7. Edgar A. Pessemier, *Product Management: Strategy and Organization* (New York: John Wiley & Sons, 1977): Chapter 5; James Myers, "Benefit Structure Analysis: A New Tool for Product Planning," *Journal of Marketing,* October 1976: 23-32.



greater the similarity between product attributes in a particular use context, the greater the likelihood of expected volume coming from a competing brand or being cannibalized from an existing brand. Unfortunately, existing knowledge of consumer behavior precludes the exact specifications of the sources and amounts of new product volume. Therefore, judgmental scenarios examining alternative revenue sources and amounts in pro forma profit and loss statements as depicted in the table should be developed.

The question remains as to what level of cannibalism can occur and still warrant a "go" decision for the new product. According to William Reynolds, about 70 percent of Mustang sales in the car's introductory year were to buyers who would have purchased another Ford had the Mustang not been introduced; 30 percent represented incremental volume.[8] Cadbury, describing the recent introduction of a chocolate bar in England, reports that over 50 percent of its volume came from market expansion, with the remaining volume coming from existing company products.[9] Both products were considered successful introductions by their respective firms. The apparent diversity in cannibalism rates suggests that cost structure, degree of market maturity, and competitive appeal of alternative offerings will affect cannibalism rates and their importance to the sales and profitability of a product line and individual items. George Murray and Harry Wolfe have developed a potentially useful analytic model which combines a company's cost and profit structure with a qualitative assessment of consumer purchase patterns to determine an optimal product line.[10]

It is also possible to calculate the incremental unit volume necessary to overcome the effects of cannibalism. This measure can be used as a benchmark for evaluating market capacity and the quality of introductory marketing programs early in the business analysis stage. The expression is as follows:

$$\begin{array}{c}\text{Incremental volume}\\ \text{to offset}\\ \text{cannibalism effect}\end{array} = \begin{array}{c}\text{Cannibalized}\\ \text{unit volume}\end{array} \times \begin{array}{c}\text{Ratio of the}\\ \text{old and new}\\ \text{product margins}\end{array}$$

Using figures from the previous example, the incremental new product volume necessary to overcome the effects of cannibalism is approximately 267,000 units: 200,000 units x \$1.00 contribution/\$.75 contribution. In other words, at the estimated cannibalism rate, the new product must generate an incremental volume from new and competitors' customers of 267,000 units to offset the loss of contribution dollars from the existing product. In effect, for this illustration, a 21 percent increase in incremental new product volume over forecasted levels would be required. Issues surrounding market capacity and the quality of the introductory product program assume a different light in this context.

Despite the insights garnered from pretests and preliminary volume forecasts, the best method for assessing the actual degree of cannibalism is a market test. Test markets afford the final opportunity for cannibalism research prior to commercialization of the new product. Cannibalism research at this juncture should focus not only on monitoring the new product but also on existing company products to determine whether new product volume is arising from existing products, the competition, or market expansion.[11] Knowledge of volume sources should assist in interpreting test market results and affect the "go" or "no go" decision. □

8. William Reynolds, "More Sense About Market Segmentation," *Harvard Business Review*, September-October 1965: 107-114.

9. N. D. Cadbury, "When, Where, and How To Test Market," *Harvard Business Review*, May-June 1975: 96-105.

10. George Murray and Harry Wolfe, "Length of Product Line," *California Management Review*, Summer 1970: 79-85.

11. See Glen Urban, "A Mathematical Modeling Approach to Product Line Decisions," *Journal of Marketing Research*, February 1969: 40-47, for a description of a model designed to test distribution, advertising, and price cross-elasticities. Urban's model provides a conceptual and quantitative interpretation of interproduct substitution in a test market, and prescribes normative marketing mix strategies for new and existing products.